



Superfund At Work

Hazardous Waste Cleanup Efforts Nationwide

Love Canal Site Profile

Site Description: A 3,200-foot-long canal filled with chemical wastes

Site Size: Original canal, 16 acres; capped area, 40 acres; fenced area, 70 acres; Emergency Declaration Area, 350 acres

Primary Contaminants: Heavy metals, polycyclic aromatic hydrocarbons, dioxin, volatile organic compounds, and pesticides

Potential Range of Health Risks: Neurotoxic effects; carcinogens

Nearby Population Affected: 70,000 people within 3 miles

Ecological Concerns: The Niagara River and aquatic species

Year Listed on NPL: 1983

EPA Region: 2

State: New York

Congressional District: 32

Success in Brief

Catalyst for Environmental Responsibility

Love Canal in Niagara Falls, New York was the first hazardous waste site to gain national notoriety. Newspapers and television chronicled the fear and anger as citizens learned that 22,000 tons of dangerous chemical wastes buried 30 years earlier had begun to seep into backyards and basements. A series of emergency orders evacuating homes captured the nation's attention and raised public awareness across the U.S. Literally thousands of hazardous waste sites marred the landscape from Maine to California, some worse than Love Canal.

But public perception about the dangers at this site served as a catalyst for elected officials to write the first federal legislation that authorized:

- the Superfund cleanup program directed by the U.S. Environmental Protection Agency (EPA); and
- effective enforcement to hold waste contributors accountable for remediating sites, thus deterring further indiscriminate disposal of hazardous wastes.

The new Superfund law provided the impetus for widespread changes in the way manufacturers do business, including the emergence of environmentally safe, "green" products and innovative cleanup technologies. In the last 25 years, the stigma left at Love Canal has been

replaced with a national environmental consciousness, a new generation of activists, and consumer demand for products from renewable resources.

The Site Today

A permanent, high density polyethylene-lined cap, a layer of clay soil, and a leachate collection and treatment system now contain and monitor the chemicals in the old canal. By now, 140 families have moved into refurbished, once-evacuated homes. Environmental monitoring continues to ensure the long-term safety of those living and working in the area.

Photo: New York State Department of Environmental Conservation, 1978

Engineers take samples of black sludge from the basements of homes closest to Love Canal.

A Site Snapshot

The Love Canal Site is in an urban area, 1/4 mile north of the Niagara River in upstate New York. Approximately 70,000 people live within three miles of the site.

Love Canal was a 3,200 foot channel built by William T. Love in the late 1800s for hydroelectric purposes. Subsequently, his efforts were abandoned. Between 1942 and 1953, approximately 22,000 tons of drummed and liquid chemical wastes were disposed of in the abandoned Love Canal by Hooker Chemical & Plastics Corporation. Over time, barrels storing some of the wastes corroded and leaked their hazardous contents into the unlined canal.

During the 1970s, unusually high precipitation in the area caused the water table within the canal to rise, bringing contaminants to the surface to spread laterally into the basements of nearby homes.

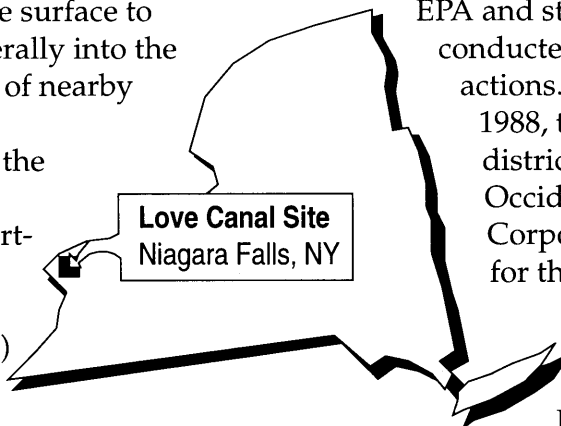
In 1978, the New York State Department of Health (NYSDOH) identified more than 80 chemicals in Love Canal and adjacent soil, including acids, volatile organic compounds, pesticides, heavy metals, and dioxins. These chemicals include neurotoxins and known

carcinogens, depending on exposure.

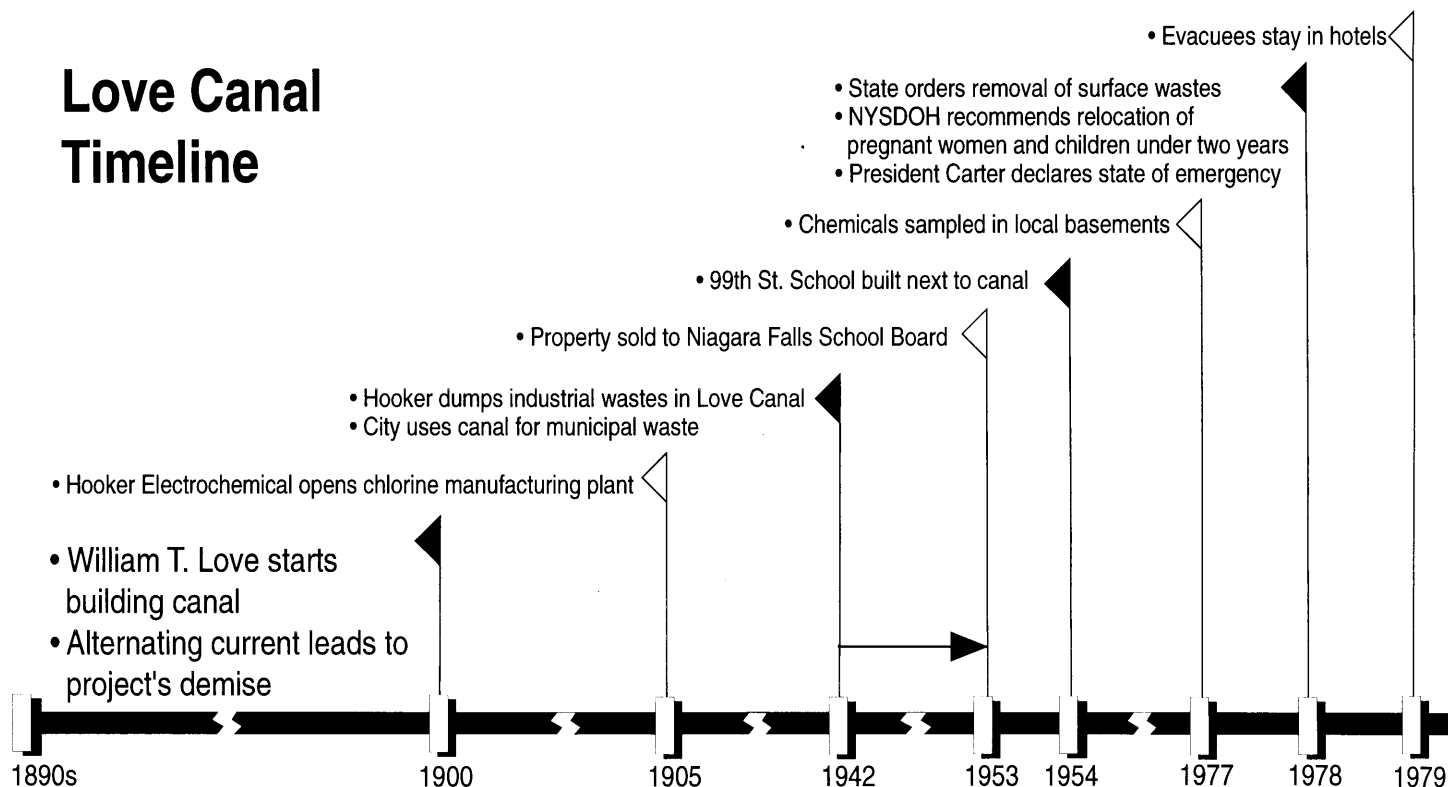
Families were evacuated and homes abandoned while

EPA and state officials conducted emergency actions. Finally, in 1988, the federal district court found Occidental Chemical Corporation liable for the governments' response actions at Love Canal.

Hooker had been acquired by Occidental which also was responsible for other contaminated sites in the area. Lawsuits and countersuits over liability burdened the courts for years.



Love Canal Timeline



The Legacy of Love Canal: "Not in My Backyard"

In the late 1890s, an entrepreneur named William T. Love planned to build a canal between the upper and lower sections of the Niagara River to provide cheap hydroelectric power for a proposed model industrial city. During construction, however, the alternating current motor was perfected, allowing transmission of electricity along long-distance power lines. Industry no longer needed to locate near a power source, and so local banks withdrew funding. The unfinished canal – 80 feet wide, 10-15 feet deep, 3,200 feet long, and dug in clay layers – filled up with water and was used by local residents for recreation.

In 1905, Hooker Electrochemical Company opened a plant to

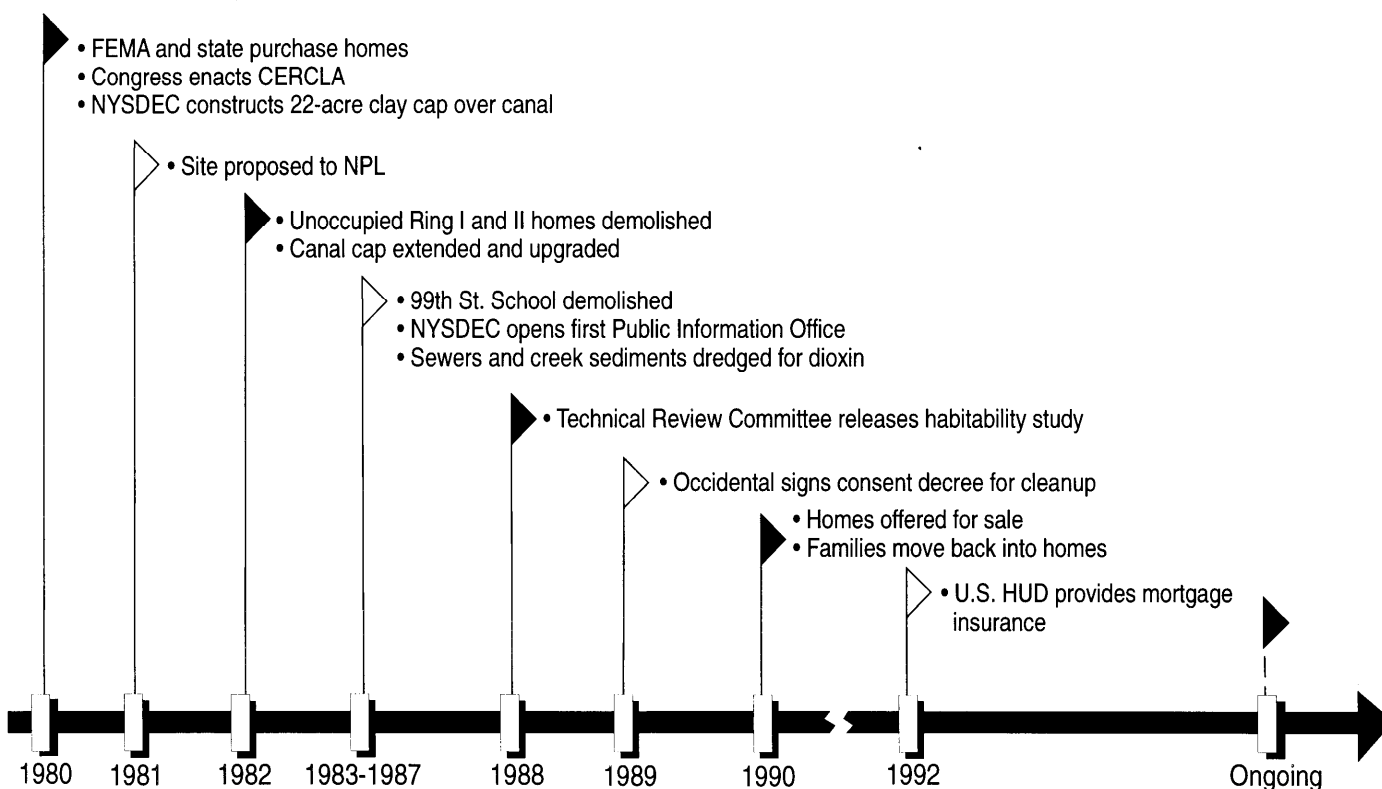
manufacture chlorine and caustic soda. In 1941, the re-named company began dumping industrial wastes into the undrained canal. The next year, Hooker acquired title to the property from Niagara Power and Development Company. Reportedly, swimming continued in the canal until the smell grew offensive and some swimmers developed a skin rash. During the 11-year period ending in 1953, Hooker dumped approximately 22,000 tons of waste in Love Canal.

Hooker Gives Property to School Board

In 1953, Hooker sold the property to the Board of Education of the City of Niagara Falls for one dollar, warning it of the

industrial wastes on the property in the deed of sale.

In 1954, construction began on a new school adjacent to the canal. Many more companies had moved to town, bringing an economic boom. As more families moved in for jobs, plans to develop a school were initiated. The school was ultimately constructed on 99th Street on property that abutted the canal. The top of the canal was covered with dirt, but its integrity was compromised by the construction of two roads across the surface. Indeed, the city subsequently allowed for extensive development of the entire area, not realizing the potential danger. The backyards of some of the newly built houses bordered the canal and



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various storm drains and sanitary sewage lines punctured the canal's sidewalls.

Toxic Materials Seep into Basements

The wonder chemicals of modern society carried a hidden "price of progress" manifested in health and environmental effects. Beginning in the mid-1960s, nearby residents occasionally complained of strong odors, and some notified authorities of a buildup of black sludge on their basement walls. A few residents noticed this same black sludge in their sump pumps.

In the 1970s, higher than normal precipitation caused the water table to rise and chemicals migrated from the canal to nearby sewers and creeks. Deteriorating drums rose to the surface, exposed to the elements.

In September 1976, the New York State Department of Environmental Conservation (NYSDEC) visited Love Canal while investigating the suspected discharge of Mirex (an insecticide) by Hooker. That fall, engineers collected sump and sewer samples for Mirex and PCB analysis and urged city officials to conduct a hydrogeological study.

Early in 1978, NYSDOH and NYSDEC contacted EPA for assistance. Additional sump and air samples found significant chemical contamination in private homes adjacent to the canal. The Commissioner of

Health directed local officials to remove all exposed or visible toxic waste and to fence off the site.

Evacuations Begin

In late July 1978, further sampling prompted the Commissioner of Health to recommend that pregnant women and children under two years of age evacuate the area immediately and that residents close off basements and avoid consuming home-grown produce. Two weeks later, President Jimmy Carter declared a state of emergency, releasing federal aid to relocate residents. An eight-foot-high chainlink fence was installed around Love Canal and the housing areas identified as Ring I and Ring II on the east and west sides.

By September 1979, the number of Love Canal residents relocated into hotels had "stabilized" to 425 people at a cost of \$7,500 per day for food and lodging. NYSDEC and city engineers worked throughout the fall to install a 7,000-foot-long barrier drainage and containment system to halt outward chemical migration. That December, NYSDEC engineers had constructed and were operating a leachate collection system and treatment facility. The Department of Justice also filed its first lawsuit against Hooker for environmental damages and recovery of emergency costs.

In May 1980, President Carter identified the Emergency Declaration Area (EDA), authorizing

\$20 million to purchase homes. More than 1,000 families were eligible to be bought out within a 10-block radius. The Federal Emergency Management Agency (FEMA) and state officials relocated hundreds of the affected families. Then in July, NYSDEC engineers covered the canal with a 22-acre, three-foot-thick clay cap to reduce the amount of precipitation entering the canal and to reduce air emissions.

New Law Initiates Superfund Program

In December 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to address thousands of hazardous waste sites nationwide. The law established a "Superfund" Trust Fund based on excise taxes from crude oil and certain commercially-produced chemicals. Based on state referrals, EPA began a National Priorities List (NPL) of sites requiring comprehensive cleanup.

In 1981, EPA proposed to add the Love Canal site to the NPL. During this period, the 237 Ring I and II homes were bulldozed. In 1982, EPA and NYSDEC extended and upgraded the clay cap to prevent precipitation from entering the canal. Engineers also repaired the barrier and leachate collection systems and cleaned contaminated sewers. In March 1983, NYSDEC opened the first Public Information Office adjacent

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to the fenced area and in June, the 99th Street School came down.

During the next few years, Superfund and state teams continued to clean up sewers and dredge dioxin-contaminated creeks and other drainage areas. In November 1984, engineers placed a high-density polyethylene liner (ironically, one of those wonder chemicals) over 40 acres of the site. The liner was then covered by 18 inches of clean soil and seeded for grass. EPA decontaminated a total of 62,000 linear feet of storm and sanitary sewers in 1986 and another 6,000 feet in 1987. An on-site facility was constructed to dewater sewer contaminants.

In 1989, EPA entered into an agreement in which Hooker, now renamed Occidental Chemical Company, would treat sewer and creek sedi-

ments. Cleanup crews removed and transported most of the waste materials to Occidental's Niagara Falls facility for storage prior to final treatment and disposal. Occidental is currently investigating the possibility of shipping the waste for final disposal outside New York State.

EPA Seeks Cleanup Costs

Following years of legal maneuvering, Occidental and other parties were found liable for the cleanup of the site in February, 1988 under CERCLA and the state nuisance law in 1989. Altogether, the Superfund program, the State of New York, and Occidental have spent approximately \$250 million (not including interest) in cleanup and relocation costs associated with Love Canal. Adding in FEMA and non-CERCLA EPA funds makes this one of the most costly hazard-

ous waste cleanup efforts in the nation.

In March 1994, a federal judge found in favor of Occidental, dismissing a case for punitive damages and ruling that the company had no malicious intent when the 1940s disposal took place. In July 1994, a cost recovery lawsuit was settled between Occidental and New York State in which the court awarded New York \$98 million.

In December 1995, Occidental agreed to pay \$129 million plus interest to resolve outstanding EPA and FEMA claims for previous remedial costs. Occidental also agreed to pay \$375,000 for natural resources damages and \$497,000 for future costs and other reimbursements. In addition, the U.S. Army will pay \$8 million for their alleged contribution of hazardous wastes during World War II and the Korean Conflict.

EPA Addresses Citizen Concerns

At the height of the crisis in 1980, Governor Hugh Carey signed legislation creating the Love Canal Area Revitalization Agency (LCARA) to help administer home buyouts and maintain the properties. Even though the Ring I and II homes would never again be occupied, LCARA was committed to rehabilitating the surrounding area.

In 1983, a Technical Review Committee composed of

representatives from EPA, NYSDEC, NYSDOH, and the U.S. Department of Health and Human Services initiated a study to determine the habitability of various neighborhoods within the EDA. All working sessions were open to the public and aimed at soliciting comments and participation from the residents of Love Canal. Every phase of the study, i.e., habitability criteria development, pilot studies, and

final study results were independently reviewed by a panel of experts in a public forum.

In 1988, after an extensive, five-year sampling and study program, EPA issued the Love Canal Emergency Declaration Area Habitability Study. Subsequently, the Commissioner of Health issued a decision that two-thirds of the EDA were habitable and safe for residential use.

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Citizen Concerns

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Since the majority of the cleanup was completed and certain areas declared habitable, 140 families moved back into the EDA, now called Black Creek Village. The area offered individuals the opportunity to purchase completely refurbished homes at affordable prices.

The Neighborhood Today

The success of the cleanup and neighborhood revitalization hinged on EPA's ability to effectively address all of the real or perceived problems facing the Niagara Falls community.

In February 1992, the federal Department of Housing and Urban Development agreed to provide mortgage insurance on these houses, discounted 15 to 20%, allowing families to purchase homes in the revitalized Love Canal neighborhoods.

Success at Love Canal

When EPA first discovered Love Canal, the Superfund program did not exist and few people recognized the threat of hazardous wastes in the environment. As more sites were discovered, and the severity of the national problem unfolded, public pressure and citizen outrage forced federal and state agencies to take drastic measures. We have the citizens of Love Canal to thank for playing a key role in waking up the nation to an era of environmental stewardship.

New legislative authority cleaned up the area so that families could move into rehabilitated homes. Manufacturers in every state had to take responsibility for proper waste disposal, recognizing the inherent dangers of chemical wastes. For that effort, a new industry entered the marketplace to design cleanup technologies and prevent pollution in the first place. The system of cap, barrier drain, leachate collection and treatment, and long-term monitoring has become a viable approach for remediating sites.

A large portion of property within the EDA east of 93rd Street has been purchased by a developer and is slated for renewed economic development with the proposed construction of over 200 new homes. The remaining areas of the EDA were deemed suitable for commercial use; thus most of the EDA will be returned to productive use.

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